



Fig. 1 North Carolina tropical reef corals, Onslow Bay, North Carolina: **A.** *Solenastrea hyades* (Dana). Scale 5 cm; **B.** *Siderastrea siderea* (Ellis and Solander). Scale 1 cm; **C.** Bottom photograph of scattered colonies *Solenastrea hyades* (Dana) on an outcrop with a thin sediment cover. Depth 22 meters

A classic marginal coral environment: tropical coral patches off North Carolina, USA

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Despite temperatures of less than 16 °C for 3 months of the year, North Carolina's Onslow Bay appears to offer a suitable habitat for two species of zooxanthellate corals: *Solenastrea hyades* (Dana) (Fig. 1A) and *Siderastrea siderea* (Ellis and Solander) (Fig. 1B). As revealed by extensive dredging (Macintyre and Pilkey 1969), these corals occur in patches between latitudes 33°30' and 34°39', growing on flat outcrops (Fig. 1C) at depths of 20 to 40 m. From mid-January to mid-April, the bottom temperatures in this area drop to levels said to be the minimum tolerance limit for the survival of tropical reef corals (Mayer 1916). *S. hyades*, the larger of the two species (maximum diameter = 40 cm), is generally well preserved, with little evidence of destruction by boring organisms, whereas *S. siderea* (maximum diameter = 10 cm) is extensively bioeroded by bivalves, sponges, and worms. Both species were found scattered on mostly Miocene calcareous quartz sandstone outcrops and are not forming a reefal framework.

A great variety of tropical fish is associated with these coral patches, most notably groupers, snappers, jacks, grunts, drums, porgies, spadefish, butterflyfish, damselfish, wrasses, barracuda, and triggerfish (Huntsman and Macintyre 1971). In addition, "the majority of the [macro benthic algae] species comprising the Carolina offshore flora are tropical and have centers of distribution in the Caribbean Sea" (Schneider 1976: p. 133).

Two principal factors allow these tropical reef communities to exist so far north. First, rock outcrops are abundant owing to the restricted supply of sediment, which is in turn related to limited river outflows. Second, the Gulf Stream migrates inshore during the summer months. However, little information is available on the life histories of these two coral species to determine whether they are capable of reproducing under these harsh conditions, and little is known about the settlement periods for their planulae. Other groups associated with these coral patches, particularly octocorals and sponges, also require more detailed study.

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Reef sites

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